# Rubidium Rover

## Light Measurement UGV


Autonomous measurement vehicle for resultant horizontal illuminance in large open areas e.g.: sporting fields

**Carry Case –** Pelican IM 2750 with custom foam housings and table for use in the field. Collapsible handle and wheels for easy transport. Airplane transport compatible. Weatherproof

**Base Station –** consists of Dell model notebook and long-distance Wi-Fi system in custom housing with dual Db antennas

**Battery Charger –** located in the carry case is a mains powered battery charger

**Batteries –** all units are provided with 4 high quality batteries. 2 for use and 2 spare giving a total of 8 hours operational endurance

**Battery Maintenance –** all units are supplied with a battery balancer and charge indicator

**Construction –** plastic and aluminium construction for rigidity and longevity. All fasteners are aluminium with aluminium rivnuts for reduced weight and reduction of corrosion

**Communications –** long distance Wi-Fi communication system with dual Db antenna on both base station and rover

**Suspension –** Proline Oil filled suspension manufactured in the US to smooth out all the bumps

**Automated Auditing –** Our system includes way point creation, automated data capture and self-auditing report creation and generation

**Rubidium Rover Body –** custom made from **REAL** carbon fibre in a new sleek design. Our new design cleanly houses all the equipment and is also designed to reduce the build-up of ground material near the light sensor

**4 Wheel Drive System –** full time drive from all 4 wheels to ensure no loss of traction with re-designed front and rear differentials

**Tyres –** new softer compound tyres for increased traction

**Power –** a strong 60A brushless power system with cooling fan and 2080KV motor and integrated IP rated on/off switch

**Obstacle Avoidance –** integrated ultra-sonic sensor for detecting and avoiding obstacles

**The Brains –** The latest in drone technology is applied installed in our IMU for the most accurate results possible

**Light Sensor –** US manufacturer light sensor module for measurement of resultant horizontal illuminance in any metric

**Global Position System (GPS) –** the latest in multiple constellation GPS antenna for the most accurate positioning possible from a single unit

**International Patent Pending**

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rubidium light

# Rubidium Rover

Rubidium Rover was developed by lighting engineers who thought there must be a better way to audit resultant lighting level in open areas like sporting fields. Rubidium Rover takes the leg work out of you lighting audits with the rover performing the measurements without input by the operator increasing accuracy and reducing time to complete the task.

Rubidium Rover can produce a typical soccer field audit in less than 10 minutes with accuracy increased due to GPS locations and the removal of shadow and tilt event caused by traditional methods.

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| **Positioning** | |
| Internal Unit | Pixhawk 2.1 Black Cube |
| Processor | 32-bit Cortex M4F on-board operating system with 32-bit failsafe co-processor |
| IMU | Triple redundant Initial Measurements Units (IMU) accelerometers, gyroscopes and compasses |
| | Temperature controlled IMUs for optimum working temperatures. |
| GPS Antenna | External GPS Antenna Here 2<br>Single IMU Compass, Gyroscope, Accelerometer and Barometer |
| Receiver Type | 72 channel u-blox M8N engine, GPS/QZSS L1 C/A, GLONASS L10F BeiDou B11, Galileo E1B/C, SBAS L1 C/A, WASS, EGNOS, MSAS, GAGAN |
| Position Accuracy | Position Accuracy 500mm +- |
| **Lighting Measurement** | |
| Light Sensor | Apogee Instruments Illuminance Sensor SE-100-SS |
| Sensitivity | 1 lux |
| Accuracy | +-5% |
| Range | 1-3000 lux |
| Directional Cosine Response | +-2% at 45°, +-5% at 75° |
| Temperature Response | Less than -0.1% per °C |
| Spectral Range | CIE 1921 luminous efficiency function |
| **Usability** | |
| Drive System | Full Time 4WD full metal driveline<br>60A Brushless power system with 2080KV brushless motor – fan cooled ESC |
| Safety | External safety switch on rover, base station safety interlock and loss of connection fail safe |
| Indicators | Multicolour LED main visual indicator<br>High-power, multi-tone piezo audio indicator |
| Suspension | Proline Powerstroke 35 oil filled red spring shock absorbers |
| **Communications** | |
| Wi-Fi Modem | RF Design RFD900x<br>32 bit core, 500kbit/sec<br>AES Hardware accelerated encryption<br>>40km line of sight range<br>2xRP-SMA RF connections diversity switched<br>1 Watt (+30dBm) transmit power<br>FCC Part 15.247 and AS/NZS 4268:2012 Compliant<br>902-928MHz(USA)/915-92MHz/(Australia)/868-870MHz (Euro) |
| **Power Equipment** | |
| Batteries | 5000mAh 2 Cell 7.4V 20C |
| Charger | Quanum E4 Cube Lipo Charger |
| Battery Balancer/Checker | Dlux Auto Checker Cell checker and auto balancer |
| **Transport** | |
| Case | Pelican IM2750 with collapsible handle and wheels impact and weatherproof.<br>Aircraft transport compliant with batteries removed<br>Custom foam inserts with on-site table in-built |